Community Knowledge, Beliefs, and Actions Regarding the use of Antibiotics in Sibuntuon Village, Uluan Toba District

Rosnike Merly Panjaitan[1], Hilda Hilda[2], Masrah Masrah[3], Mawar Sihombing[4]

[1,2,3,4] Politeknik Kesehatan Kementerian Kesehatan Medan, Jl. Jamin Ginting Km 13,5 Kel. Lau Cih, Medan Tuntungan

Email corespondensi : hildasherman.apt@gmail.com

Track Record Article

Accepted: 15 November 2022
Published: 27 December 2022

How to cite:
Panjaitan, Merly, R., Hilda, H., Masrah, M., & Sihombing, M. (2022). Community Knowledge, Beliefs, and Actions Regarding the use of Antibiotics in Sibuntuon Village, Uluan Toba District. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, 4(2), 304–316.

Abstract

Antibiotic use is relatively high in Indonesia, which will enhance the occurrence of resistance. Community understanding of receiving antibiotics is critical for treatment success and preventing resistance occurrences. The goal of this study was to describe the level of community understanding regarding the use of antibiotics in Sibuntuon Village, Uluan District, Toba Regency. This is a descriptive survey method, using 96 samples taken by the technique Simple Random Sampling in April-May 2021. The results showed that 24 respondents (25%) had good knowledge in the good category, 47 respondents (48.96%) in the fairly good category, 22 respondents (22.92%) in the bad category and 3 respondents (3.12%) in the bad category. Confidence of good respondents by 17 respondents (17.71%), in the quite good category 76 respondents (79.17%), while the category is not good by 3 respondents (3.12%) and 0 respondents (0%) in the category is not good. The actions of respondents who had a good level were 23 respondents (23.96%), in the quite good category there were 33 respondents (34.38%), while the unfavorable category was 37 respondents (38.54%), and the category was not good as many as 3 respondents (3.12%). The conclusion of this study is that the knowledge, attitude beliefs, and actions of using antibiotics in the community in Sibuntuon Village, Uluan District, Toba Regency are quite good. and there is an influence between the level of knowledge, attitudes, and actions towards antibiotic use with a significant value of 0,000. The findings of this study can inform that education regarding the use of antibiotics, both directly education and through various educational media, must continue to be carried out in the community.

Keyword: Actions, Antibiotics, Attitudes, Knowledge

INTRODUCTION

Antibiotics are chemical substances produced by fungi and bacteria, which have the property of killing or inhibiting the growth of germs, while their toxicity to humans is relatively small. Derivatives of these substances which are made semi-synthetically, also belong to this group, as well as all synthetic compounds with antibacterial properties. The first antibiotic discovered by chance *dr. Alexander Fleming* namely penicillin-G. Flemming succeeded in isolating the compound from Penicilium chrysogenum in 1928, but it was only developed and used at the start of World War II in 1941, when antibacterial drugs were urgently needed to fight infection (Muntasir, 2021)

Regulation of the Minister of Health of the Republic of Indonesia Number 2406/Menkes/Per/XII/2011 Concerning Guidelines for the Use of Antibiotics that the use of antibiotics in health services is often inappropriate which can lead to ineffective treatment,

Rosnike Merly Panjaitan dkk / Scientific Periodical of Public Health and Coastal 4(2),2022 , halaman 304-316

increased risks to patient safety, widespread resistance, and high costs of treatment. (Kementrian Kesehatan RI, 2020)

According to (WHO, 2016) almost a third (32%) of respondents surveyed in 12 countries believe that they should stop taking antibiotics when they feel better. This is the case for younger, lower-income people in rural areas. According to surveys in Sudan, Egypt and India, three quarters or more of respondents think colds and flu can be treated with antibiotics. Antibiotics are used to treat bacterial infections, whereas colds and flu are caused by viruses and therefore cannot be treated with antibiotics. This of course can lead to errors in the use of antibiotics.

Antibiotic use is quite high in Indonesia, which will increase the occurrence of resistance. According to the Resistance Control Committee Antimicrobials, the degree of bacterial resistance in Indonesia has continued to rise from 2013 to 2019. The resistant bacteria have increased from 40%, 60%, and 60.4 percent in 2019. Increased resistance events produced by the absence of antibiotic use under control. Antibiotic abuse can result in resistant (Kementrian Kesehatan RI, 2020). Antimicrobial resistance is increasing the death rate. With the rapid growth and spread of infection due to microorganism resistance, it is anticipated that by 2050, deaths from antibiotic resistance would exceed 10 million people, resulting in economic losses of over 100 trillion dollars (World Health Organization, 2019)

Antibiotic drugs are intended to treat infectious diseases. Administration of antibiotics in conditions that are not caused by bacteria is commonly found in daily practice, both in health centers, hospitals, and private practice. Incorrect selection of antibiotics to indications for dosage, method of administration, frequency and duration of administration is the cause of the weak effect of infection with antibiotics. Various studies discovered that 40-62% of antibiotics were used imprecisely, even for conditions that did not require antibiotics. According to studies, the quality of antibiotic use in various regions of the hospital ranged from 30% to 80% not based on criteria (Kementrian Kesehatan RI, 2020)

Previous research by (Pulungan, 2017)about Knowledge, belief and use of antibiotics in society Hutaraja Village, Muara Batang Toru District, South Tapanuli, based on the results there were 47.9% having a less level of knowledge and 52.1% having a less confident level from 96 participants. The majority of people as 36, 4% use antibiotics to treat flu, (68.7%) used antibiotic is amoxicillin, and the majority of respondents (53.1%) do not spend antibiotics because they feel recovered. Based on the results of the study it can be concluded that the level of knowledge and belief of the people in the Hutaraja sub-district, Muara Batang Toru District,

South Tapanuli Regency is classified as lacking and there are still many people who use antibiotics inappropriately.

The results of previous research Riberu (2018) with level of community knowledge using of antibiotics in Weoe Village, Wewiku District, Malaka, shows the level of knowledge of the Weoe Village community about most of the use of antibiotics is classified as sufficient, because out of 100 people there are 67% of respondents with sufficient knowledge, 22% of respondents with less knowledge and 11% of respondents with good knowledge. General knowledge about antibiotics is 66% sufficient category, knowledge based on how to use and time and duration of use of antibiotics is 72.73% sufficient category, knowledge based on how to store antibiotics is 62.83%, knowledge based on how to obtain antibiotics is 57% sufficient category and knowledge about the side effects of using antibiotics is 47% in the less category.

Knowledge and beliefs are related factors and can influence the behavior of each individuals use of antibiotics. Knowledge by itself is not sufficient to change behavior, but it plays an important role in shaping beliefs and attitudes. The consequence of using antibiotics with less knowledge has the potential to lead to misunderstandings about the use of these antibiotics. Given that the inappropriate use of antibiotics in society continues to be a problem in developed countries, it is necessary to provide information on knowledge and beliefs about antibiotics. However, the provision of similar information is still quite rare, especially in Indonesia (Meinitasari et al., 2021).

The people of Sibuntuon Village, Uluan District, Toba Regency are one of the people who belong to the knowledge and belief who trust a drug from the environment or are said to be other people's experiences. It can also be a determining factor in the inappropriate use of drugs such as the use of antibiotics. The behavior of the people of Sibuntuon Village, Uluan District, Toba Regency in the widespread use of antibiotics is very possible due to the easy access of the community in obtaining antibiotics. Antibiotics, which should only be obtained with a doctor's prescription at official health care facilities, are very easy to obtain at retail stores, stalls or small kiosks in the area. Antibiotics obtained in stalls or retail kiosks generally do not receive drug use information (PIO). Although there is, the information conveyed is minimal and it is not uncommon for the information conveyed to be inaccurate due to a lack of knowledge, so that the antibiotics used by the community become irrational (Baroroh et al., 2018).

Antibiotic use necessitates information and attitudes about how to use them correctly. Knowledge is a crucial component in the process of forming real action. Positive attitudes will

alter as a result of good understanding, and actions will become more oriented (Haryanto et al., 2016). A study conducted in the District East Lampung revealed a 65% level of public knowledge against excellent antibiotics and a 60% positive attitude toward antibiotic use (Pratiwi, 2018). While conducting research in Aceh Besar District, the results show that public knowledge of antibiotics is still low (54%) and attitudes toward antibiotic use are also poor (57%) (Rahmawati, 2017). This is why public awareness of antibiotic use is so important.

Therefore, a study was conducted to find out how to describe the level of the knowledge, beliefs and actions of using antibiotics in the community in Sibuntuon Village, Uluan District, Toba Regency.

METHODS

The research method utilized was observational, with a descriptive survey design. The population of Sibuntuon Village is 688 people consisting of 351 men and 337 women. In general, the livelihood of the people in this village is farming. The population in this study is the productive age range 17-55 years in Sibuntuon Village, Uluan District, Toba Regency. The number of samples in this study was determined by the Lemeshow formula (Lemeshow, 1991). The sample size in this study was 96 people. The sampling method used in this research is technique simple random sampling that taking from members of the population randomly without regard to strata in the population, which is assumed to be a homogeneous population, determining the sample according to inclusion criteria who filled out the questionnaire link between April - May, 2021. Data analysis is processed descriptively.

The type of data used in this study is primary data, obtained directly from questionnaires which were given directly to the respondents. The questionnaire contains questions and selected answers that have been prepared, and secondary data are collected by researchers from various existing sources. Secondary data can be obtained from the Head of Sibuntuon Village, namely regarding the total number of people in the area. The questionnaire was compiled based on the literature obtained and then made into a statement that was tested for validity and reliability using SPSS and the Pearson correlation method. Statements that meet the validity and reliability requirements are then used as a questionnaire in this study. The questionnaire assessed knowledge of using antibiotics, confidence and action in the use of antibiotics (Notoatmojo, 2010). Thirty respondents were subjected to a validity test. The questionnaire's validity was determined by comparing the value of r count to the value of r table (0.3051). The statement is true if the r count value is bigger than the r table value. Thus, only 20 of the 43

statements verified for validity are valid and can be used as a questionnaire. Cronbach's alpha was utilized in this study for the reliability test, which has a minimum value of 0.60 in the dependable group. If the r calculated value is greater than the Cronbach's alpha value, or 0.6, then the statement can be said to be reliable (Sugiyono, 2017).

All statements on the questionnaire are included in the reliable category. The questionnaire contains several statements that are measured using the Guttman scale. Assessment is given with a score of 1 (one) for the correct answer and a score of 0 (zero) for the wrong answer. The number of questions for each sub-variable measured is 5, so the highest score is 5. The scoring for drawing conclusions is determined by comparing the scores achieved per maximum score. Good knowledge category if the answers are 76–100% correct, good enough (56-75%), not good (40–55%), and not good (40%).

RESULTS

The characteristics of the respondents in this study included age, gender, occupation, and education obtained from the results of the questionnaire who use antibiotics from 96 respondents. Based on Table 1, it is known that the majority of respondents were female; as many as 68 respondents (70,84%), the highest frequency distribution for the age group is at the age of 36 - 55 years and over, there are 52 respondents (53.79%), the highest frequency of education is high school, as many as 73 respondents (76.04%), the most distribution frequency of work is as a farmer, as many as 49 respondents (51.04%).

Table 1. Distribution of Respondent Characteristics

Characteristics	n	%
Gender		
Man	28	29,16
Woman	68	70,84
Age		
17-35	44	46,21
36-55	52	53,79
Education		
Elementary school	2	2,02
Junior high school	10	10,41
Senior high school	73	76,04
College	11	11,45
Occupation		
Civil servants	1	1,04
Farmer	49	51,04
Entrepeneur	17	17,70
Student	20	20,83
Teacher	3	3,12
Housewifes/others	3	3,12

Based on the results of the research that has been carried out, the results of the respondents knowledge data regarding the using antibiotics as follows:

Table 2. Frequency Distribution Level of Knowledge using Antibiotics

Use of Antibiotics	n	%
Good	24	25
Pretty good	47	48,96
Not good	22	22,92
Bad	3	3,12
Total	**96**	**100**

Based on table 2 above, it can be concluded that the level of knowledge using the antibiotics owned by the majority of respondents is in the pretty good category, namely 47 respondents (48.96%), and a small proportion is included in the poor category, namely 22 respondents (22,92%). The total score obtained by respondents regarding their knowledge of using antibiotics is 617, so the level of knowledge using antibiotics of respondents is 64.27%. The average level of knowledge of using antibiotics in Sibuntuon Village, Uluan District, Toba Regency is in the fairly good category.

Table 3. Frequency Distribution Level of Confidence in using Antibiotics

Attitude	n	%
Good	17	17,71
Pretty good	76	79,17
Not good	3	3,12
Bad	0	0
Total	**96**	**100**

Based on the data obtained in Table 3, it shows that the level confidence beliefs for using antibiotics were is for the majority of respondents to be in the good category, totaling 76 respondents (79.17%). The average result of the level confidence of using antibiotics in Sibuntuon Village, Uluan District, Toba Regency was 726, so the level of convidence of respondents regarding the using of antibiotics was 79.19% was included in fairly good category.

Table 4. Frequency Distribution Level of Action using Antibiotics

Action	n	%
Good	23	23,96
Pretty good	33	34,38
Not good	37	38,54
Bad	3	3,12
Total	**96**	**100**

Based on table 4, the distribution of the level of action using the antibiotics owned by the majority of respondents was included in the not good category, namely 37 respondents (34,54%), and in fairly good category, namely 33 respondents (34.38%). The total score obtained by the respondents was 596, so the level of action of using antibiotics was 62,08%. The average level of action of using antibiotics in Sibuntuon Village, Uluan District, Toba Regency is in pretty good category.

DISCUSSION

Antibiotic drugs are intended to treat infectious diseases. Administration of antibiotics in conditions that are not caused by bacteria is commonly found in daily practice, both in health centers, hospitals, and private practice. Incorrect selection of antibiotics to indications for dosage, method of administration, frequency and duration of administration is the cause of the weak effect of infection with antibiotics (Ministry of Health RI, 2021). Antibiotic use is helpful and effective when prescribed and taken in accordance with rules, however the use of antibiotics is still not suitable, increasing the cost burden of society and frequently increasing antibiotic resistance (Rasdianah et al., 2022).

According to the (CDC, 2015) antibiotics can only be used to treat infectious diseases caused by bacteria and are not useful for treating viral diseases such as flu or cough. Antibiotics must be taken with a doctor's prescription. The prescribed dose and duration of use should be followed even if you feel well. In addition, antibiotics should not be stored for the use of other diseases in the future and cannot be shared with others even if the symptoms of the disease are the same. The strategy of therapy with antibiotics is determined by the characteristics of the infectious phenomenon, the location of the infection, the identification of the cause of the infection, the physiopathological condition of the patient, as well as a comprehensive knowledge of the antibiotics available in the therapeutic area.

Antibiotics have different ways of working in killing or inhibiting the growth of microorganisms. Classification of various antibiotics is made based on the mechanism of action, namely: Antibiotics that inhibit bacterial cell wall synthesis. Examples are penicillin, cephalosporin, carbapenem, monobactam and vancomycin. Antibiotics that work by destroying the cell membrane of microorganisms. Antibiotics of this class damage the permeability of cell membranes resulting in leakage of materials from the intracellular. An example is polymyxin. Antibiotic that inhibits the protein synthesis of microorganisms by affecting the 30S and 50S

ribosomal subunits. These antibiotics cause reversible inhibition of protein synthesis. Examples are chloramphebicol which is bactericidal against other microorganisms, as well as macrolides, tetracycline and clindamycine which are bacteriostatic. Antibiotic that binds to the 30S ribosomal subunit. These antibiotics inhibit protein synthesis and result in cell death. An example is the aminoglycoside which is bactericidal. Antibiotics that inhibit the synthesis of nucleic acid in microbial cells. Examples are rifampicin which inhibits the synthesis of RNA polymerase and quinolones which inhibit topoisomerase. Both are bactericidal. Antibiotics that inhibit enzymes involved in folate metabolism. Examples are trimethoprime and sulfonamides. Both are bacteriostatic (Ministry of Health RI, 2021)

Antibiotic resistance is the ability of bacteria to neutralize and weaken the effectiveness of antibiotics. Broadly speaking, bacteria can become resistant to an antibiotic through 3 mechanisms: The drug cannot reach its site of action within the microbial cell. In gram-negative bacteria, small and polar antimicrobial molecules can penetrate the outer wall and enter the cell through tiny holes called porins. If the porin disappears or undergoes a mutation, the entry of this antimicrobial will be inhibited (World Health Organization, 2019). Drug inactivation This mechanism often causes resistance to the aminoglycoside and beta lactam groups because microbes are capable of making enzymes that destroy these two antimicrobial groups. Microbes change the binding sites of antimicrobials. This mechanism is seen in methicillin-resistant S.aureus (MRSA). This germ changes its penicillin binding protein (PBP) so that its affinity decreases for methicillin and other beta-lactam antibiotics (Muntasir, 2021).

Antibiotic resistance can occur due to several factors below Frequent use of antibiotics. Regardless of rational use or not, antibiotics that are often used will usually reduce their effectiveness. Therefore, the irrational use of antibiotics should be reduced wherever possible. Irrational use of antibiotics, various studies showed that the irrational use of antibiotics, especially in hospitals, is an important factor that facilitates the development of germ resistance. long-term use of antibiotics (Nurmala & Gunawan, 2020). Giving antibiotic resistance has units which are expressed in KHM (Minimum Inhibitory Concentration) or MIC (Minimum Inhibitory Concentration). MIC is the smallest level of antibiotics that can inhibit the growth and development of bacteria. The increasing value of KHM illustrates the initial stage towards resistance (Kementrian Kesehatan RI, 2020)

Antimicrobial Stewardship Programs are a Ministry of Health supplemental initiative that aims to influence or direct the use of antibiotics in health care facilities and the population. Pharmacists can provide information either orally or in writing. The Drug Information

Services Unit (PIO) prepares written information about antibiotics in the form of education and counseling, with the primary goal of increasing public compliance in using antibiotics according to doctor's orders, preventing bacterial resistance, and raising awareness. In order to promote the implementation of patient safety programs, inform patients and their families about potential side effects or adverse drug reactions (ADRs) (Ministry of Health RI, 2021).

Community and their families might get antibiotic use counseling on an outpatient or inpatient basis. Pharmacists provide active outpatient counseling to all patients that receiving oral or topical antibiotics. Outpatient counseling should be done in a designated drug counseling room in apotecary to preserve patient privacy and make it easier for pharmacists to assess the ability of patients and their families to accept the information that has been delivered. Counseling should be done utilizing the show and tell method, together with the distribution of written information in the form of leaflets, flyers and others (Kementrian Kesehatan RI, 2020).

Characteristics of respondents totaling 96 people which include, age, occupation, and education obtained from the results of the questionnaire respondents who use antibiotics. The dominant respondents were female, totaling 68 respondents (70.84%), while the male respondents were only 28 respondents (29.16%). According to data obtained from the population of Sibuntuon Village is 688 people consisting of 321 men and 367 women in general being adults. The residents in this village make their living through farming. On the one hand, ages can have an impact on knowledge. This is significant because age influences catching ability as well as people’s manner of thinking. As people become older, their thinking habits improve, and they absorb more and more knowledge (Dietz, 2021), and with the level education, adults women are more concerned about their health, so they are more active in seeking information or knowledge about their health and for the family as a mother. This is in line with research that suggests that women care more about health than men because women are able to obtain more information or knowledge because they often interact and are more active than men (Kondoj et al., 2020).

The knowledge studied is the result of respondents' knowledge regarding of information and using antibiotics. Based on the data obtained in Table 2, it shows that the level of knowledge of the respondents regarding of using antibiotics is mostly in the pretty good category, totaling 47 respondents (48.96%). The results of the average knowledge in society Sibuntuon Village, Uluan District, Toba, namely 617 (64.27%), are in the quite good category.

Knowledge is the result of human sensing or the result of knowing someone about objects through their senses. Knowledge basically consists of a number of facts and theories that enable a person to be able to solve the problems they face. This knowledge is obtained from direct experience and the experiences of others (Notoatmojo, 2010). One of the factors that influence a person's knowledge is the level of education. In addition to a person's level of education, this respondent's knowledge is also due to the experience of other people, both from print and electronic media regarding information on the use of antibiotics (Novelni et al., 2020). So it can be seen from the results of research on the people of Sibuntuon Village, Uluan District, that education does affect the knowledge of respondents because the education category of the most respondents is senior high school (SMA) level, so they have fairly good knowledge about the use of antibiotics.

In this study, the respondents' confidence in the Sibuntuon village community in the use of antibiotics obtained from the results of the overall confidence level score was in a fairly good category (69.79%). Confidence is an attitude, then one's beliefs are not always true. Usually beliefs are passed down from generation to generation and without prior evidence (Notoatmojo, 2010). Sufficient levels can occur due to lack of awareness or desire of respondents in maintaining health, healing or improving health. This means that the higher education they get is in line with the respondents' beliefs, including the use of antibiotics. In research conducted in Yogyakarta Students (Gana, 2018) was found higher knowledge and greater a person's understanding about antibiotics, the better of attitude and action for not using antibiotics without a prescription.

From the results of the overall action level score, it was found that the respondent's action level on the use of antibiotics was quite good (62.08%). This good action was obtained due to the lack of public adherence to the use of antibiotics. This means that efforts are still needed to improve action because there is still a lack of community compliance. These results are consistent with previous research (Sugihantoro, 2020) that human action is basically goal-oriented. As for factors that can create societal attitudes, knowledge that can influence attitudes regarding antibiotic use is still deemed sufficient. According to (Meinitasari et al., 2021) knowledge alone will not influence conduct, but it will help in the formation of beliefs and attitudes. Revealed that patient knowledge and beliefs have a substantial impact on antibiotic adherence. Because the information supplied is in the form of books and movies that explain of antibiotics and are designed in such a way that responders are eager in studying it, a positive attitude is established. However, the results of this research are different from

(Sianturi, 2021) was found that there is no relation between the amount of knowledge and attitudes regarding the use of antibiotics in Students HKBP Nommensen Medan. In theory, individual knowledge about something influences attitudes and behaviors, but there are other elements that can impact attitudes and actions, such as belief, experience, and societal values. Student attitudes and behaviors are also significantly influenced by environmental influences, therefore someone with good degree of knowledge is frequently influenced to take wrong attitudes and acts influenced by friends or experience around them.

CONCLUSIONS

An overview of the level knowledge of the Community of Sibuntuon Village, Uluan District, Toba Regency, regarding the use of antibiotics is in the fairly good category (64.27%), the level of confidence of the community is in the fairly good category (69.79%), and the action of community towards use in the fairly good category (62.08%). Knowledge of the use of antibiotics is critical in solving cases of resistance that occur in the community due to inappropriate use behavior, so the findings of this study can inform that education regarding the use of antibiotics, both directly educational counselling and through various educational media, must continue to be carried out in the community.

REFERENCE

Baroroh, Utami, Maharani, L., dan Mustikaningtias, I. (2018). “Peningkatan Pengetahuan Masyarakat Melalui Edukasi Tentang Penggunaan Antibiotik Bijak dan Rasional”. *Ad-Dawaa' Journal of Pharmaceutical Sciences*, Vol. 1 No. 1. https://doi.org/10.24252/djps.v1i1.6425

CDC. (2015). Center for Diseases Control and Prevention “*Get Smart. Know When Antibiotics Work”*. http://www.journals.uchicago.edu/doi/pdf/10.1

Dietz, Laura, Anne, B., Ulrike, F. (2021). “Age and Knowledge Exchange: Ability, Motivation, and Opportunities”. *Book Chapter Draft for the 2021 SIOP Organizational Frontiers Series Volume Age and Work: Advances in Theory, Methods, and Practice*.

Gana, Theodorus, G. P. (2018). “Hubungan Pengetahuan Tentang Antibiotik Dengan Sikap Dan Tindakan Penggunaan Antibiotik Tanpa Resep Di Kalangan Mahasiswa Ilmu Kesehatan Universitas Respati Yogyakarta”. *Thesis Repository Pharmacy Department. Sanata Dharma University*.

Haryanto, Priambodo, dan Lestari E,. (2016). “Kuantitas Penggunaan Antibiotik pada Pasien Bedah Ortopedi RSUP DR. Kariadi Semarang”. In *Agus Priambodo, Endang Sri Lestari JKD* (Vol. 5, Issue 3).

Kementrian Kesehatan RI. (2020). “Pedoman Pelayanan Kefarmasian untuk Terapi Antibiotik”. Direktorat Jenderal Bina Kefarmasian dan Alat Kesehatan. Kementrian Kesehatan RI. https://farmalkes.kemkes.go.id/2014/12/pedoman-pelayanan-kefarmasian-untuk-terapi-antibiotik/ updated on August 2021.

Lemeshow, S. dan Lwanga. S. K. (1991). “Sample Size Determination in Health Studies. A Practical Manual”. *World Health Organization Repository and Publication. Geneva, Buckingham*. https://apps.who.int/iris/bitstream/handle/10665/40062/9241544058_

Meinitasari, E., Yuliastuti, F., & Santoso, S. B. (2021). “Hubungan tingkat pengetahuan terhadap perilaku penggunaan antibiotik masyarakat”. *Borobudur Pharmacy Review*, Vol 5 No. (1), 7–14. https://doi.org/10.31603/bphr.v1i1.4869

Ministry of Health RI. (2021). “Handbook for the Use of Antibiotics”. *DIRECTORATE GENERAL OF PHARMACEUTICAL AND MEDICAL DEVICES MINISTRY OF HEALTH REPUBLIC OF INDONESIA*.

Muntasir, A. (2021). “*Antibiotik dan Resistensi Antibiotik” BUKU ANTIBIOTIK DAN RESISTENSI ANTIBIOTIK*. CV. IKAPI. Bogor : Jawa Barat

Notoatmojo. (2010). “*Metodologi Penelitian Kesehatan”*-.

Novelni, R., Azyenela, L., & Septiana, Y. (2020). “Hubungan Tingkat Pendidikan Masyarakat Terhadap Pengetahuan Dalam Penggunaan Antibiotik Oral Di Apotek Kecamatan Koto Tangah Padang”. *Jurnal Penelitian Farmasi Indonesia*, Vol. 9 No. (2), 2020.

Nurmala, S., & Gunawan, D. O. (2020). ”Pengetahuan Penggunaan Obat Antibiotik Pada Masyarakat Yang Tinggal Di Kelurahan Babakan Madang”. *FITOFARMAKA: Jurnal Ilmiah Farmasi*, *Volume 10 No.1*, hal; 22–31. https://doi.org/10.33751/jf.v10i1.1728

Pratiwi, Widayati, A. 2018. “Pengetahuan Mengenai Antibiotika di Kalangan Mahasiswa Ilmu-ilmu Kesehatan”. *Jurnal Forum Kesehatan*. 2(10): 61-70.

Pulungan, Pajar. (2017). ”Pengetahuan, Keyakinan Dan Penggunaaan Antibiotik Pada Masyarakat Di Kelurahan Hutaraja Kecamatan Muara Batang Toru Kabupaten Tapanuli Selatan”.

Rahmawati. 2017. “Pengetahuan dan Sikap Masyarakat Terhadap Antibiotik di Puskesmas Kota Jantho Kecamatan Kota Jantho Kabupaten Aceh Besar”. [skripsi]. Fakultas Farmasi, Universitas Sumatera Utara, Medan.

Rasdianah, Ain Thomas, N., Hiola, F., Nur, S., Ahmad, ain E., & Farmasi Fakultas Olahraga dan Kesehatan, J. (2022). “Perbedaan Pengetahuan dan Sikap Masyarakat Terhadap Pemberian Booklet dan Video Dagusibu Antibiotik”. *Journal Syifa Sciences and Clinical Research (JSSCR)*, *4*(2). https://doi.org/10.37311/jsscr.v4i2.15547

Riberu, Vinsensius. (2018). “Tingkat Pengetahuan Masyarakat Tentang Penggunaan Antibiotik Di Desa Weoe Kecamatan Wewiku Kabupaten Malaka”.

Santoso, Singgih. (2016). *Statistik non parametrik : konsep dan aplikasi dengan SPSS*. Elex Media Komputindo.

Sianturi, Mega, Saurmauli, Henny, Ompusunggu, Djohan. (2021). “Hubungan Tingkat Pengetahuan Tentang Antibiotik dengan Sikap dan Tindakan Penggunaan Antibiotik Tanpa Resep pada Mahasiswa Universitas HKBP Nommensen Medan”. *Health & Medical Journal*, *Volume III No. 1.*

Sugihantoro, Hajar. (2020). “Hubungan Pengetahuan Dan Perilaku Penggunaan Antibiotik (Studi Kasus Pada Konsumen Apotek-Apotek Kecamatan Glagah Kabupaten Lamongan)”. *Jurnal Ilmiah Farmasi Farmasyifa*, *3*(2), 102–112. https://doi.org/10.29313/jiff.v3i2.5655

Sugiyono. (2017). “Metode Penelitian Kuantitatif Kualitatif dan R&D”.

Kondoj, Veronika, Astuty Lolo, W., & Jayanto, I. (2020). “Pengaruh Tingkat Pengetahuan dan Sikap terhadap Penggunaan Antibiotik di Apotek Kimia Farma 396 Tuminting Kota Manado”. *Pharmacon Journal UNSRAT, Vol. 9 No. 2.*

WHO. (2016). *WHO Report on Surveillance of Antibiotic Consumption*. https://www.who.int/publications/i/item/9789241514880WHO.

World Health Organization. (2019). *Antibiotic Resistance: Multi-country public awareness survey*. www.who.int